embryos of several marsupial genera, including native bears and opossums, and some kangaroo and wallabies. I must get many more before I shall have enough to work out all the problems of the development. I shall be deeply indebted to any one who will inform me in time of an approaching kangaroo drive. It matters not to me whether the drive be in New South Wales, Victoria, Queensland, or South Australia, so long as the place be fairly accessible. A drive where the kangaroos are yarded would be preferable. An answer, giving an estimate of the number of animals likely to be obtained, addressed to my headquarters, Board of Health Office, Sydney, will reach me.

"In Camp, Burnett River, Queensland, 1884." "Yours, &c., W. H. CALDWELL."

I can only add an expression of thankfulness for having lived to see solved, and mainly by Mr. Caldwell's persevering researches, a biological problem which I have sought to determine since the date of a paper on the *Ornithorhynchus* in the 'Philosophical Transactions,' 1832, p. 517.

EXPLANATION OF PLATE XIII.

Fig. 1. Anterior or ventral view of the female organs, urinary bladder, and cloaca (nat. size) of Echidna hystrix; the right uterus laid open, and exposing a collapsed ovum.

Fig. 2. The same parts, with both uteri laid open.

(In both figures: a, ovarium; b, abdominal orifice of oviduct, b'; c, uterus; d, urogenital canal or cloaca; e, urinary bladder; f, uterine ovum; g, hyalinion or outer tunic; h, vitelline mass.)

Fig. 3. Ovum from the right uterus, with the vitelline or undeveloped embryonal mass exposed.

XLVI.—On the Coleopterous Genus Macrotoma. By Charles O. Waterhouse.

Having recently had occasion to examine some specimens of the genus *Macrotoma* and to consult various Catalogues referring to this group of Longicorns, I was surprised in all cases to find *Macrotoma Hayesii*, Hope, placed as a synonym of *M. serripes*, Fabr., the Munich Catalogue giving *M. Hayesii* as the male, and *M. serripes* as the female. I do not know how this very great error originated; but it is difficult to conceive how any one who had compared the figures given

by Hope and Olivier could have supposed them to represent the sexes of the same species. The figure given by Olivier from the type in the Banksian collection very fairly represents the insect, which is of peculiar form, and not at all like the elongate M. Hayesii. The type is a male. I have never seen any other specimen. The female would doubtless be difficult to distinguish from M. prionobias, White. M. Thomson has not noticed the error of confounding these two species, and in his 'Systema Cerambycidarum,' where he correctly gives M. serripes as the type of the genus, he adds M. Hayesii as a synonym. In his description of M. natala (Classif. des Céramb. p. 315) he compares it with "M. serripes," but is evidently referring to M. Hayesii*.

In the description of M. valida ("Typi Ceramb.," Rev. Zool. 1877, p. 271), M. Thomson, unfortunately, does not say whether the femora are spined on the upper as well as the lower edge, although his comparing it with M. natala rather implies this; hemerely says, "Pedes laves, nitidi, modice spinosi"—a very loose way of giving important characters in a

very difficult genus.

If, as I suppose, M. valida, Th., has both edges of the femora spined, it may possibly be the female of the true M.

serripes. This is, however, only a suggestion.

At the end of his description of *M. serricollis* ("Typi Ceramb.," Rev. Zool. 1877, p. 272) M. Thomson has the following observation:—"Assez grande et belle espèce très-distinct, qui, avec *M. absurda*, White, *M. serripes*, Oliv., *M. gregaria* (Dej.), Th., et *M. scutellaris*, Germ., compose le genre *Prionobius*, Muls., d'ailleurs identique avec le genre actuel."

M. serricollis is described as having "Pedes validi, asperi, omnes subtus spinosi." M. serripes is the type of the genus Macrotoma. M. absurda is one of those species which have a few spines on the upper as well as the under side of the femora, and also has some very small spines on the tibiæ; it cannot therefore be a Priorobius, which is characterized by

its having the tibiæ not spined.

This leads me to another error. In the Stettin. ent. Zeit. 1881, p. 313, Dohrn has a note on *M. absurda*, Newm., in which he gives it as his opinion that that species should be placed in the genus *Remphan* (among other reasons) because it has the "anterior angles of the prothorax projecting over the head"—a character quite foreign to *M. absurda*, which has only a small acute tooth at the anterior angle.

Another view of M. serripes is to regard it as "M. dimidi-

Lacordaire (Gen. d. Coléopt, viii. p. 97) evidently refers to M. Hayesii as M. serripes,

aticornis, Dej." This was adopted by Chevrolat, and by the late Adam White, in the British-Museum collection [but not in his catalogue], and as I had not, when I wrote my descriptions of Madagascar Macrotomæ, discovered this erroneous determination, it is to this "serripes" that I alluded in the description of M. obscura (Ann. & Mag. Nat. Hist. v. (1880), p. 410). My description is, however, not materially affected by the reference.

The following species appear to be undescribed:—

Macrotoma signaticollis, sp. n.

3. Dark brown, the head, base of the antennæ, the thorax, and front femora nearly black. Basal joint of the antennæ twice as long as broad, very rugose; the third joint as long as the fourth, fifth, and half the sixth together, very rough, and closely spinose beneath; the following joints with a few large punctures, the fourth and fifth with a few small spines beneath; the extreme apex of the eighth, the base and apex of the ninth, and the whole of the tenth and eleventh joints longitudinally grooved. Thorax one quarter narrower in front than at the base, densely punctured on the disk, somewhat rugose on the sides; the lateral spines moderately long: on the fore part of the disk there are two elongate, oblique, uneven, slightly more shining impressions: there is a short, obscure, smooth line running from the middle of the disk to the base, which has a narrow more shining border. The elytra are parallel and convex, somewhat rugosely sculptured, especially near the scutellum; the apical sutural angle distinctly dentiform. Anterior femora asperate and rather closely spined beneath. The anterior tibiæ very rough and closely spined. The posterior femora shining, with a few obscure punctures, and with a series of small spines beneath; the tibiæ not very closely asperate-punctate, with a few short fine spines on both edges. Prosternal process arched, unusually broad and flat, i. e. the middle is not raised above the level of the margins; opaque, densely and finely punctured. Metasternum opaque, densely and finely punctured; the central part shining and pubescent, finely but obscurely punctured, with an admixture of larger punctures; the dull and shining parts divided by a sharply defined line. Abdomen smooth and shining, with irregular punctuation at the sides, and there is some obscure punctuation at the base of the basal segments.

'Hab. ——? One of the examples bears the label "Africa, T. B. Berington." It is, however, so completely an Indian form that I think there must be a mistake in the label. The species should be placed between M. luzonum and M. Ellioti,

described below. It differs from *M. Ellioti* in having the legs and antennæ much more spinose; the apical joints of the latter differently and more strongly grooved, and relatively shorter, the third joint being about equal to the five apical joints taken together; whereas in *M. Ellioti* the third joint is not much longer than the three apical joints together. The thorax is rather more convex and less dull, owing to the punctuation not being quite so much crowded; the discoidal impressions are smaller, narrower, and less conspicuous, and the smooth border at the base is very narrow and obscure.

Macrotoma Ellioti, sp. n.

3. Fuscons, with the elytra brown; the apex of the antennæ and the posterior legs, and the tarsi somewhat pitchy. Head coarsely punctured between the eyes, with the usual frontal impression not very deep, impunctate; the back of the head closely and finely granulose. Antennæ reaching to two thirds the length of the elytra; the basal joint about twice as long as broad, closely and very coarsely punctured: the third joint 14 millim, long, as long as the fourth, fifth, and two thirds of the sixth joints taken together, the surface somewhat wrinkled and punctured, the front margin and under surface with short spines; the fourth to eighth joints shining and sparingly punctured above; the ninth more finely and more closely punctured; the apex of the ninth and the apical joints opaque and longitudinally rugose: there is a small opaque spot on the underside of the apex of the third joint; and on the outer side of the apex of the fourth, fifth, sixth, seventh, and eighth joints there is a small, slightly elongate opaque spot; the eighth has also a small spot at the base, and the whole side of the ninth is opaque. Thorax one fifth broader at the base than at the apex, dull, densely and finely punctured, with two triangular shining marks on the disk. Immediately ontside each of these marks is a small round rugose spot, which emits a rugose line towards the sides and directed backwards. The middle portion of the base is shining and strongly punctured, with a smooth line emitted from its fore margin to the middle of the disk, and at each side there is a rugose line directed forwards towards the sublateral rugose spot. The marginal spines are short and not very numerous. The elytra are rusty brown, a little paler towards the apex; densely and moderately finely rugulose-punctate and extremely finely granular, the granulation becoming gradually more distinct towards the base, till near the scutellum the surface is rough. Each elytron has the usual four lines. The sutural angle is not spined. The

anterior femora and tibiæ are rough and beset beneath with short acute spines. The posterior femora are shining, sparingly and obscurely punctured, with a few short acute spines beneath. The posterior tibiæ are moderately strongly, but not very closely, punctured on the outer side, with a few very small teeth below. Prosternal process densely and moderately finely punctured, strongly margined on each side. Mesosternum rather more finely punctured and deeply impressed on each side. Metasternum pubescent, densely and finely punctured, except a large triangular medial patch, which is shining and very delicately punctured. Abdomen shining in the middle, somewhat opaque at the sides.

Length 28 lines. Hab. India (Elliot).

Macrotoma inscripta, sp. n.

Fuscous, with the elytra brown, dusky at the base. Head coarsely punctured between the eyes, with a longitudinal, smooth, scarcely impressed space in the middle, but with a deep incision between the antennal tubers; the vertex of the head is coarsely but not closely punctured, the sides finely granulose. The thorax is somewhat dull, about one fifth broader at the base than at the apex, densely and finely punctured, with two triangular, shining, strongly punctured impressions on the disk, nearly united to each other and to a smooth line which proceeds from the shining punctured space at the base of the thorax. On each side there is a small rugose spot, and at the end of the smooth basal space there is a short rugose line directed obliquely forwards.

Length 22 lines.

Hab. India; Bombay?

This species is close to the preceding, but is smaller. The vertex of the head is not closely granulose as in that species, and the impression between the eyes is much less marked. The antennæ are very similar, but the basal joint is relatively shorter, about one third longer than broad, and not spined beneath; the third joint is less rough, with fewer and smaller spines below, and is only equal in length to the fourth, fifth, and about one third of the sixth joints taken together. The metasternum has scarcely any pubescence, and the punctured portion is separated from the smooth space by a still more sharply defined line; indeed the line dividing them is slightly raised. The posterior femora have only a few small spines, and those on the tibiæ are very short and are seen with difficulty. One or two very small spines may also be traced on the upper edge of the femora.

Macrotoma plagiata, sp. n.

Nearly black, with the elytra fuscous. Third joint of the antennæ as long as the fourth, fifth, and sixth taken together. Thorax dull, densely and finely punctured, with two shining, sparingly punctured, very slightly raised patches on the disk, with a rather deep impression on the inner side of each. On the side there is a small punctured shining spot, and at the base a transverse shining space (also punctured) having a smooth line proceeding from the centre to the middle of the disk. In one specimen this basal space is united to the lateral spot by a shining line. The teeth at the sides of the thorax are extremely short.

Length 20 lines.

Hab. N. India (Bowring).

This species is very close to the preceding, but, besides the difference in colour and the relative length of the third joint of the antennæ, it differs in having the disk of the thorax more convex, and the two dorsal shining spots are more ovate and slightly above the surrounding surface; the front legs and basal joints of the antennæ are less rough, and the spines on the posterior femora and tibiæ are very minute, the latter appearing at first sight smooth.

Macrotoma absurda, Newm.

This species is extremely close to the preceding. All the examples, however, before me have the intermediate and posterior femora more or less furnished with small spines on the upper edge, and the third joint of the antennæ is only equal in length to the fourth, fifth, and a little more than half the sixth taken together. The examples vary in length from

13 (the type) to 24 lines.

The female is rather more elongate than the male. The antennæ reach to about the middle of the elytra, are slender and shining, the apex of the ninth and the whole of the tenth and eleventh joints being opaque. There is an opaque spot on the underside of the apex of the third and following joints, the fifth and sixth have also a spot at the base, and on the seventh, eighth, and ninth the basal and apical spots nearly unite. The thorax is smooth and shining above, with a few punctures at the base, and on the fore part of the disk are two oblique impressions with a slight longitudinal swelling between the impression and the lateral coarse punctuation; a little removed from this swelling there is a second, small, round, smooth, elevated spot; there is a well-marked but small impression in the middle of the base. The metasternum

is clothed with yellow pubescence, finely and delicately punctured, but the punctuation is more indistinct in the middle area. Legs shining and sparingly punctured. The femora furnished with a few slender spines both above and below. The tibiæ have a few spines on the inner side.

Length 24 lines.

" Prionus crenatus, Fabr."

There is in the Museum collection a single male example from M. Chevrolat's collection which bears the Dejeanian label "Macrotoma lugubris, mihi, h. in India orient. D. Latreille," and Chevrolat's label, "Pri. crenatus, F. S. El. 2. 264." It differs from M. absurda only in having the thorax and elytra more convex, with the dorsal marks less impressed. It is perhaps not distinct from M. absurda. I see no reference to P. crenatus, Fabr., in Gemminger's Catalogue. The Fabrician description would apply to this insect fairly well; but I think it doubtful whether "magnus" would have been applied in this group to a species only 22 lines long.

Note.—M. signaticallis, Ellioti, inscripta, plagiata, absurda, and M. ancipennis* compose a small group allied to M. luzonum, F., characterized by the males having a closely punctured opaque metasternum, with a triangular shining area

in the middle.

Macrotoma Fisheri, sp. n.

3. Ferruginous; the head, three basal joints of the antennæ, and the anterior femora nearly black; the intermediate and posterior legs and all the tarsi pitchy. The whole of the metasternum and the parapleuræ clothed with fulvous-yellow

pubescence.

Head opaque, moderately strongly and closely ocellatepunctate on the forehead, densely and finely granulose posteriorly; the deep excavation between the antennal tubers with
only a few punctures. Antennæ reaching to two thirds the
length of the elytra; the basal joint strongly but not very
closely punctured; the third joint 12 millim. long, flattened
above, not very closely or strongly punctured, the underside
moderately asperate. The fourth to seventh joints smooth
above, the seventh more closely punctured than the preceding
joints; the eighth to eleventh joints opaque; there is an
opaque spot on the underside of the apex of the third joint;
the fourth joint is opaque at the side for nearly the whole
length, and the fifth, sixth, and seventh joints are opaque at
the side for their whole length, the opaque portion having a

* Waterhouse, Trans. Ent. Soc. 1881, p. 428.

fine longitudinal smooth line in the middle. Thorax coarsely rugose, one third narrower in front than at the posterior angles, the sides nearly rectilinear; the disk flattened (or even slightly concave), with a small smooth spot in the middle; the marginal spines are very acute (about fifteen in number) and moderately strong. Scutellum opaque, sparingly punctured. Elytra searcely wider than the base of the thorax, parallel, pale yellowish brown, with rather darker shade on the shoulders and scutellar region [very much as in M. luzonum]; very finely rugulose; the scutellar region beset with minute dark tubercles; the sutural angle not spined. Anterior femora very rough; the tibiæ not very closely asperatepunctate above; beset with strong acute tubercles below. The intermediate femora smooth and shining, beset with not very numerous minute tubercles; the posterior femora with still fewer tubercles; the lower edges of the femora have some very small acute spines; the tibiæ are sparingly punctured, and have a series of very small spines on the lower edge. The prosternal process is coarsely punctured. The mesosternum is opaque, pubescent, deeply impressed on each side. The whole of the metasternum finely punctured and pubescent, the middle portion not quite so closely. Abdomen not very shiny, finely and not very closely punctured.

Length 32 lines.

Hab. Burmah (Bowring).

Macrotoma ægrota, Newm.

I have not yet seen the male of this species. A specimen in the Museum collection measures 28 lines in length, the type being only 19 lines.

Macrotoma serricollis, Dejean.

Q. Dark fuscous, the elytra rusty yellow, with the base and longitudinal ridges ferruginous. Head rugose. Antennæ reaching to about the middle of the elytra, slightly dull; the first and third joints moderately strongly but not very closely punctured. The third joint as long as the fourth, fifth, and half the sixth joints taken together. The fourth, fifth, and sixth joints with the lower half on the outer side smooth, with only a very few punctures; the upperside of these joints, as well as nearly the whole of the seventh, closely and finely punctured; the eighth to eleventh opaque and somewhat rough, but not longitudinally channelled. The thorax is nearly twice as broad at the base as at the anterior angles, all the surface rugose, the base deeply sinuate behind each of the

posterior angles, which consequently are very prominent and directed backwards and outwards. The fore part is impressed above. The margins have about nine acute teeth. elytra are at the base a little broader than the thorax, but are distinctly broader a little behind the middle, and then again somewhat narrower, convex at the base, flattened posteriorly, leaving the sutural region (between the suture and the first costa) somewhat raised above the rest of the surface till near the apex; there is a second costa not much removed from the first, and the space between them is concave. There is a well-marked sublateral obtuse costa, which extends nearly to the apex; the side of the elytra outside this costa is nearly perpendicular, the margin itself being reflexed. The usual third costa is absent, the space between the second costa and the lateral one being gently concave. All the basal region is rugose, and the rough sculpture is continued for some distance down the sutural region and on the lateral costa. The prosternal process is very coarsely rugose. The metasternum is closely and finely punctured and pubescent. The abdomen is somewhat dull, closely and very finely punctured, with the apical margin of the segments smooth and shining. The femora are sparingly asperate-punctate, with a few very small spines beneath; the tibie are rough, with a few very small spines on the inner edge.

Length 24 lines.

Hab. Java (coll. Dejean).

M. Thomson has in his "Typi" (Rev. Zool. 1877, p. 273) described a species under the name of M. serricollis, Dej., to which I have alluded above. I think, however, that his insect cannot be the male of the species I have just described, and I therefore propose to call the female Dejeanian example M. Dejeanii.

It is closely allied to M. Wrightii (Waterh. Ann. & Mag. Nat. Hist. v. 1880, p. 414), from the Seychelle Islands; and if it were not for the colour of the elytra and the locality, I should have considered them as sexes of the same species.

Macrotoma Cowani, sp. n.

J. Black, with the elytra and abdomen dark brown. Head very coarsely rugose. Antennæ long, reaching beyond the apex of the elytra; the first joint a trifle more than twice as long as broad, rugose; the third joint moderately asperate, with some very small acute tubercles below, as long as the fourth, fifth, and one quarter of the sixth joints taken together; the fourth to eighth joints are very finely punctured, the punctuation obscure on the fourth and fifth joints,

more distinct and very close on the sixth, seventh, and eighth; these joints have also a few large punctures. There is a very small opaque spot at the apical outer angle of the fifth and sixth joints; on the seventh there is a more elongate spot and a similar one at the base; on the eighth joint these spots nearly meet in the middle of the joint; the ninth joint is entirely opaque at the side and partially so at the base and apex above; the tenth and eleventh opaque and longitudinally finely rugulose. Thorax very rugose, one quarter narrower at the anterior angles than at the base; somewhat abruptly enlarged before the posterior angles, which are produced into a short strong spine. The disk is longitudinally impressed in the middle, and on each side of the impression the rugose punctuation is less dense, so that the surface is shining; at the base there is a smooth shining patch. Elytra opaque, closely and very finely granular, the granules at the base very distinct and shining. Metasternum closely and finely punctured and pubescent. Anterior femora very rugose and with short strong spines below. Anterior tibiæ opaque and rough, with numerous short strong spines on both edges. Posterior femora opaque and finely rugose, with numerous strong spines on the upper and lower edges; the tibiæ less opaque, with strong spines on the upper edge, and some very small ones on the lower.

Length 25 lines.

Hab. Madagascar, Fianarantsoa (Cowan).

This species differs from M. obscura in having much longer antennæ and in having the thorax somewhat constricted in front, with a smooth patch at the base, and without any distinct lateral spines.

Macrotoma Watersii, sp. n.

d. Very similar to M. Cowani, but almost entirely black (the elytra having only a slight pitchy tint). It differs chiefly in the thorax and antennæ. Head very rugose, with a well-marked longitudinal frontal impression. Antennæ extending to the apex of the elytra; basal joint twice as long as broad, slightly rough and strongly punctured; third joint as long as the fourth, fifth, and one third of the sixth joints taken together, finely rugose, with deep punctures scattered over the surface; the underside flat (but not concave), beset with not very numerous very small acute tubercles; the fourth, fifth, and sixth joints obscurely and finely punctured, with some large punctures interspersed; the seventh joint is similar, but slightly dull; the eighth is a little more strongly sculptured; the ninth is longitudinally rugulose (except a spot

in the centre), and the tenth and eleventh joints are entirely rugulose. There is no distinct opaque lateral spot till the sixth joint, where there is a long and narrow one; on the seventh the apical spot is longer, and there is also one at the base; on the eighth the basal and apical spots nearly meet; and the whole of the side of the ninth joint is opaque. The anterior femora are very rugose, with short strong spines above and below; the tibiæ are finely rugulose, with short spines on both edges. The intermediate femora are smooth and shining at the base, with a few large punctures; the apical half is more opaque and finely rugulose; the spines on the upper and lower edges are strong and acute. The tibiæ are very finely rugulose; the spines on the upper edge are strong, those on the underside are very small. [The posterior legs are wanting.]

Length 29 lines.

Hab. Madagascar, Betsileo country. Collected by Mr. Thomas Waters.

Macrotoma dimidiaticornis, Dej.

3. Black above, pitchy beneath; parallel, convex. Head deeply and irregularly punctured between the eyes; the vertex and sides closely and rather finely granulose. Antennæ reaching to a little beyond the middle of the elytra, the fourth and following joints pitchy red; the basal joint strongly punctured, but the punctures are not crowded together; the third joint as long as the fourth, fifth, and half the sixth joints taken together, shining, with a few deep punctures; the fourth to eighth joints shining and sparingly punctured above, the fifth to eighth with a few longitudinal punctures at the base and apex; the ninth is less shining, and at the base and apex slight longitudinal lines may be traced; the tenth and eleventh are dull, but scarcely rugose; taken together they are as long as the third joint. Thorax about one third narrower in front than at the base, very closely and rugosely punctured, somewhat dull, and more or less pubescent, the disk with three irregular impressions, the margins irregularly dentate. Elytra parallel, densely and coarsely rugose, the usual longitudinal lines obsolete. Anterior femora with not very numerous asperate punctures, and with a few very short teeth below; the tibiæ sparingly punctured, with a few tubercles beneath. The posterior legs similar, but a little smoother. Metasternum finely and closely punctured, and clothed with yellowish pubescence. The apex of the abdomen with fulvous hair.

Length 21-25 lines.

Hab. South Africa (Dr. Smith).

I have already alluded to this species as one of those in collections under the name *M. serripes*, Oliv., but which I fail to find described. It must not be confounded with *M. scabridorsis*, White (Cat. Long. Brit. Mus. 1853, p. 38). *M. scabridorsis* differs from the one above described in being less opaque, more black below, and the pubescence on the thorax, sternum, and apex of the abdomen is black or nearly so. The basal joint of the antennæ is more closely punctured, and the third joint is channelled above. The fifth joint has a dull longitudinal impression at the side, extending from the apex nearly to the base; and on the following joints this impression gradually increases in extent. The female has the three apical joints very short, broad, and longitudinally rugose.

I should imagine from M. Thomson's imperfect description of M. atropisoptera ("Typi," Rev. Z. 1877, p. 272) that his insect is very close to, probably identical with, M. scabridorsis. Curiously enough he says that his species is known in come collections under the name M. pubicollis, Bohem. MSS., "qu'elle ne mérite d'aucune façon." All the Museum examples of M. scabridorsis have the thorax more or less pubescent, but the pubescence being black, it is only visible in

certain positions.

M. Thomson gives the length 32 to 37 millim. The specimens of M. scabridorsis vary from 31 to 42 millim.

British Museum, South Kensington, November 1884.

XLVII.—Notes on Batrachians. By G. A. BOULENGER.

Rana corrugata, Ptrs.

I am now convinced that the locality of the specimen said to be from Ningpo in the British Museum is erroneous. That specimen was purchased from Cuming, and in going through the lizard collection I have found strictly Ceylonese species also labelled "Ningpo," and obtained from the same dealer. Rana corrugata must therefore be regarded as restricted to Ceylon.

Rana erythræa, Schleg.

At the time of the publication of the 'Catalogue,' although a great number of specimens had passed through my hands, the male was unknown to me. Having received several male